



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/574,492	05/26/2006	Masahiro Watanabe	1026350-000099	2369

21839 7590 10/03/2008
BUCHANAN, INGERSOLL & ROONEY PC
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER

DOLLINGER, MICHAEL M

ART UNIT	PAPER NUMBER
----------	--------------

1796

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

10/03/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ADIPFDD@bipc.com

Office Action Summary	Application No. 10/574,492	Applicant(s) WATANABE ET AL.	
	Examiner MICHAEL DOLLINGER	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/03/2006</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
2. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claims 1, 3, 5 and 6 contain phrases beginning with "may" such as in claim 1 line 7 the phrase "may contain aromatic ring(s)". It is unclear whether these phrases indicate required limitations or optional limitations. All dependent claims are affected by these rejections.
4. Claim 6 recites the limitation "the side chain" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

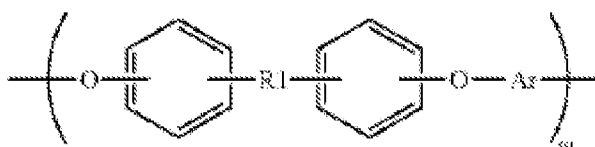
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 1796

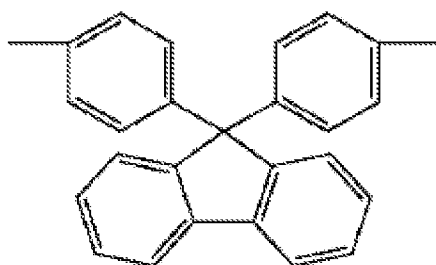
6. Claims 1, 3-8 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirano et al (WO02/2091507), please note that equivalent US 7,258,941 B2 is used as a direct translation.

7. Hirano et al disclose polymer electrolyte membranes comprising a polyether sulfone block copolymer comprising (A) a hydrophilic segment containing sulfonic groups and (B) a hydrophobic segment containing no sulfonic acid groups [column 5 lines 35-39]. The hydrophilic segment (A) contains the structural unit (2):



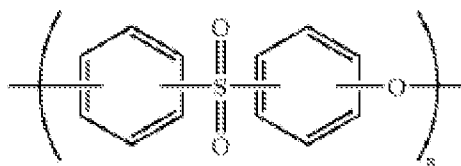
[column 5]

wherein R1 represents C(=O) or S(=)₂ and Ar represents a divalent aromatic group including:



[column 6].

The hydrophobic segment (B) comprises the structure (1):



[column 6]

Art Unit: 1796

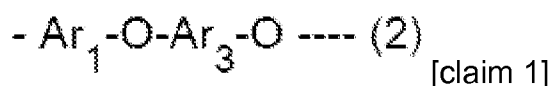
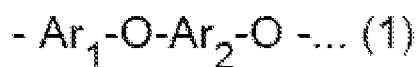
in which two consecutive structure (1)'s read on the claimed structure (-O-Ar₂-O-Ar₁-).

The sulfonic acid group is preferably introduced into Ar [column 6 line 26], and the sulfonic acid group is either introduced either by selectively sulfonating the copolymer or pre-sulfonating the hydrophilic segment [column 7 lines 64 through column 8 line 5].

The hydrophilic segment (A) is preferably synthesized by a dihydric phenol [column 9 lines 16-19] such as 9,9-bis(4-hydroxyphenyl)fluorene [column 9 line 31] and an aromatic dihalide [column 9 lines 16-19] such as 4,4'-difluorobenzophenone [column 9 line 41] while the hydrophobic segment (B) is synthesized from a dihydric phenol and an aromatic dihalide [column 8 lines 12-17] such as bis(4-chlorophenyl)sulfone [column 8 line 18] and bis(4-hydroxyphenol)sulfone [column 8 lines 28-29].

8. Claims 1-5 and 7-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakaguchi et al (JP 2003-147076).

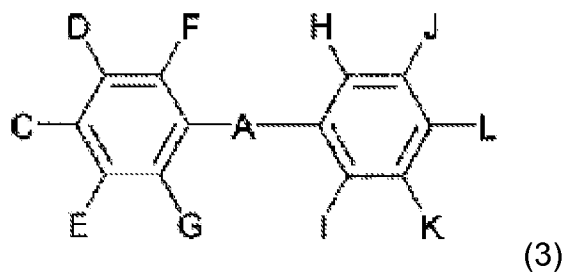
9. Sakaguchi et al disclose polymer electrolyte membranes containing sulfonated fluoride containing polymers with repeating units of formulae (1) and (2):



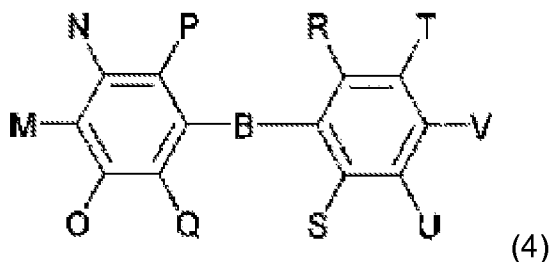
[claim 1]

wherein Ar₁ is shown in formula (3) and Ar₂ is shown in formula (4):

Art Unit: 1796

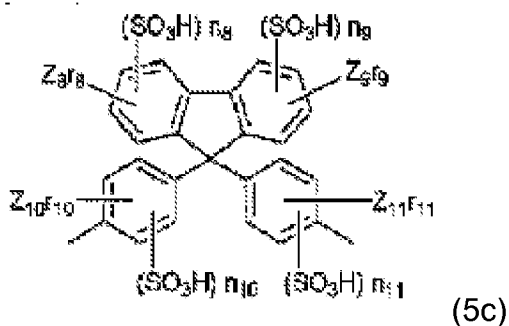


wherein A is a ketone or sulfone group and C-G or H-L may be, *inter alia*, a single bond, hydrogen or halogen atom,



wherein B is a single bond, sulfone group, a ketone group or an alkylidene group of 1-6 carbon atoms and M-Q or R-V is a single bond, hydrogen or halogen atom [claim 1].

Ar₃ is shown in formula (5c):

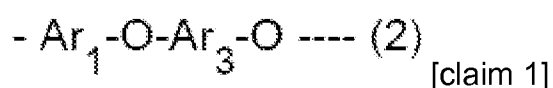
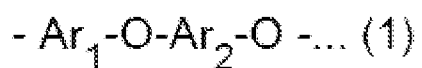


wherein n_8 - n_{11} are integers of 0-2 and $n_8+n_9+n_{10}+n_{11}=1-8$ [claim 1] and r_8 - r_{11} are preferably 0 [claim 2]. In the event that B is a propylidene group (3 carbon atoms) and A is a sulfone group then the disclosed polymer will read on the claimed polymer and membrane of claims 2 and 9.

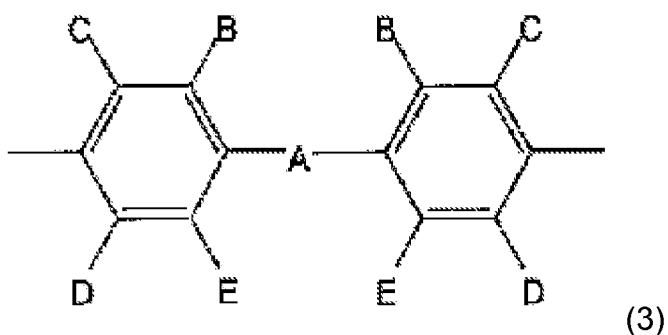
Art Unit: 1796

10. Claims 1-5 and 7-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakaguchi et al (JP 2003-147074 A).

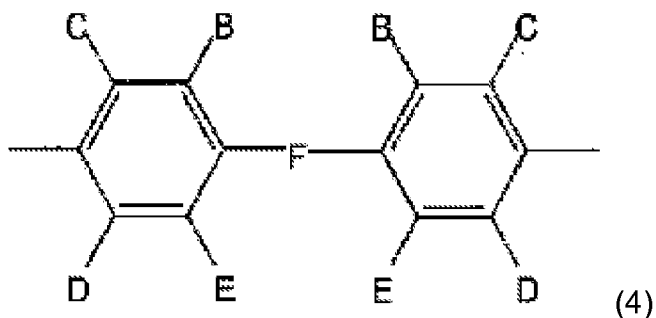
11. Sakaguchi et al disclose polymer electrolyte membranes containing sulfonated fluoride containing polymers with repeating units of formulae (1) and (2):



wherein Ar_1 is shown in formula (3) and Ar_2 is shown in formula (4):

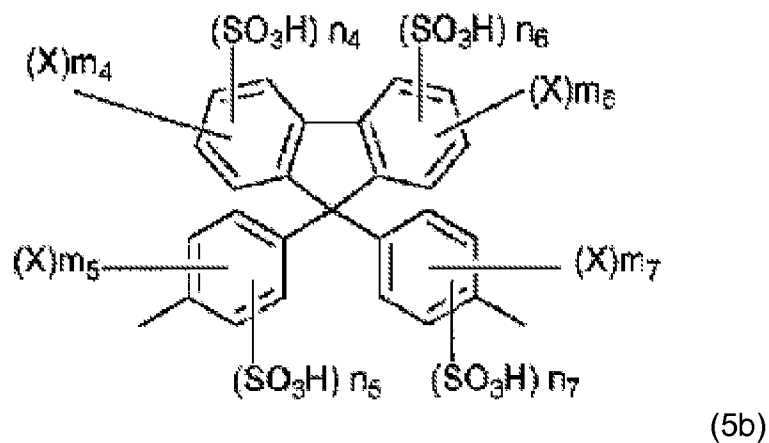


wherein A is a ketone or sulfone group and B, C, D, and E may be hydrogen aliphatic groups, nitro groups, chlorine, bromine, and iodine,

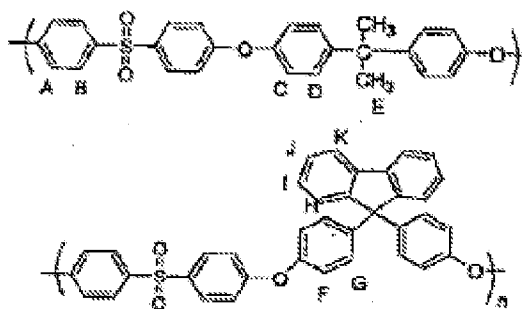


wherein F is a single bond, a sulfone group, a ketone group, an ether group or an alkylidene group with 1-6 carbon atoms [claim 1]. Ar_3 is shown in formula (5b):

Art Unit: 1796



wherein n_4 - n_7 are integers of 0-2 and $n_4+n_5+n_6+n_7$ is an integer greater than zero. The drawing 7 shows a polymer of the formula



which is sulfonated on the fluorene group [0085] and henceforth anticipatory of the polymer and membrane in claims 2 and 9.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL DOLLINGER whose telephone number is

Art Unit: 1796

(571)270-5464. The examiner can normally be reached on Monday - Thursday
7:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Randy Gulakowski/
Supervisory Patent Examiner, Art Unit 1796

MICHAEL DOLLINGER
Examiner
Art Unit 1796

/mmd/